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**"Poverty in Pre-Reform Uzbekistan:
What Do Official Data Really Reveal?"**

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November 1993

Abstract

Application of a conventional all-Union per-capita income poverty line for 1989 shows the incidence of poverty in the Central Asian republics of the former USSR to have been far higher than in the European republics. The paper investigates this phenomenon, concentrating on Uzbekistan, the largest Central Asian republic, and taking the Ukraine as a basis for comparison from among the European republics. The analysis is based on 1989 data from the Family Budget Survey, a source which has been rightly criticised but at the same time has been far from fully exploited. We consider (i) the importance of allowing for household size and composition, (ii) the presence and valuation of agricultural income in kind, (iii) the distribution of food shares, as an alternative measure of living standards. We draw out the implications of the analysis for the measurement of poverty and associated issues in post-Union Uzbekistan.

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1. Introduction

A stylised fact about living standards in the former USSR is that the Central Asian republics were, and still are, considerably poorer than other republics. Through much of the history of the Union this view was based largely on anecdotal reports from the Russian language press and academic journals, together with published figures on mean per capita income by republic. At the end of the 1980s it appeared to be substantiated by data on the distribution of income by republic, based on household surveys, published by the USSR central statistical office, Goskomstat. The period of *glasnost* saw renewed interest in the measurement of poverty, investigation of which had been repressed for a long time. Commenting on the 1989 budget survey results, Goskomstat noted that 'it is customary to count families with an average per capita income of below 75 rubles per month as poor' (1990, p.4, our translation); Figure 1 shows the proportion of individuals in each republic with per capita income beneath the 75 ruble level, as shown by the 1989 survey data. The figures for all four core Central Asian republics of Kyrgyzstan, Turkmenistan, Uzbekistan and Tajikistan exceed 30 percent and are notably higher than for all other republics (with the exception of Azerbaidzhan); they seem to show that a far greater section of the Central Asian population was in poverty (on the above definition) than in the European republics. These data have attracted considerable attention from international organisations concerned with the transition process in the former USSR. For example, the study of the Soviet economy published in 1991 by the IMF, World Bank, OECD and EBRD, provides the same information as in our Figure 1 in a table referring explicitly to poverty levels by republic (IMF et al, 1991, Table IV.6.14).

In this paper we focus on poverty in Uzbekistan. With 20 million inhabitants in 1990 it is (in terms of population) the largest of the Central Asian republics and the third largest republic of the former Union. The population is predominantly rural, some 60 percent in 1990, and there is a consequently high share of total employment that is in agriculture - over one third - much of which is devoted to cotton production on irrigated land (although the bulk of the country is semi-desert). The age structure is very young, with over 40 percent of the population beneath the age of 15 in 1990 - the result of rapid population growth, which averaged 2.6 percent per year

between 1979 and 1989.¹

With these characteristics, the apparently high incidence of low incomes in Uzbekistan relative to much of the former Union may come as no surprise. The republic has a socio-economic profile of a less-developed country quite different from the European republics. Figure 1 shows the proportion of persons in Uzbekistan with incomes beneath the 75 rubles per capita level in 1989 as being 44 percent, second only to that in Tajikistan. The individuals concerned represented 28 percent of all individuals in the former Union with per capita income beneath this level, the single largest concentration of low incomes in the USSR (Atkinson and Micklewright, 1989, Figure 8.10).

At the same time, the comparison of poverty in the Central Asian republics with that in the European republics is a more complex task than a casual inspection of Figure 1. We investigate some of the issues using the household survey data from 1989 on which Figure 1 is based, taking Ukraine as an example of a European republic.² Although there is historical interest in considering differences by republic in living standards, the break-up of the USSR means that these differences no longer have relevance for such issues as re-distribution of income across the Union. Our use of the data aims to serve two other purposes. First, the comparison of Uzbekistan with Ukraine at a time when they formed part of the same country with common currency and data sheds light on problems of measuring poverty in Central Asia, and we focus on issues that are of continuing interest following the collapse of the Union. Second, in analysing the data for 1989 we are laying down evidence on living standards against which the impact of economic reform in Uzbekistan can be judged.

Section 2 describes our sources of information. Principal among these is the Family Budget Survey (FBS) of the former USSR. This survey has been subject to extensive criticism, which we summarise, but it remains the only source of information on most aspects of household incomes and consumption in the individual republics at the time of the break-up of the Union. Although we do not have access to the survey micro-data, we are able to draw on extensive tabulations in the published report for 1989 which until now have been largely unused both in Russian language and Western reports. Taking the

¹ Data taken from World Bank (1992, pp.418-9).

² We choose Ukraine in preference to the Russian Federation due to the heterogeneity of the latter associated with its huge size.

FBS on its own terms with all its defects, there is still, in our view, a considerable amount which we can learn from the data, both about the pre-reform situation and about methodological issues for the measurement of living standards during transition.

In Section 3 we consider the implications for poverty measurement of the large household sizes in Uzbekistan. The use of a per capita poverty line as in Figure 1 makes no allowance for economies of scale in the household, which other things equal will have resulted in higher estimates of poverty in republics of the former Union with larger average household sizes. Some observers have pointed to this as the principal cause of the pattern observed in Figure 1 but we conclude that differences in household size and composition explained only a small part of the difference in incidence of low per capita incomes in Uzbekistan and Ukraine in 1989.

The importance of agriculture in the Central Asian republics implies that the issue of agricultural income in kind may be critical, and anecdotal evidence suggests this to be the case (e.g. Lubin, 1984). The disequilibrium in the goods market which characterised the pre-reform situation means that the Goskomstat practice of valuing such income in the FBS at official state prices may have resulted in substantial undervaluation. In Section 4 we examine the data in the FBS on the importance of agricultural income in kind for different household types and at different points in the income distribution.

The official poverty line in the USSR at the end of the 1980s was framed in terms of income. In Section 5 we move away from measuring living standards by income and look at food shares, a commonly used indicator in less-developed countries. The tabulations available to us provide distributions of food share by per capita income group. These allow a cross-tabulation of "food-share poverty" by "income poverty" and they also show whether the comparison of Uzbekistan and Ukraine on the basis of low incomes is robust to a switch to a basis of high food shares.

Section 6 concludes the paper by discussing the measurement of poverty in Uzbekistan in the future, including measures of individual household living standards not considered in earlier sections.

2. Survey Data in Uzbekistan

The data we use come from two household surveys of the USSR relating to 1989.³ The first, which we make more use of, is the Family Budget Survey (FBS). This operated continuously from the early 1950s until the break-up of the Union, collecting information from households on their incomes, expenditures, consumption, durable ownership and other characteristics. Some 90,000 households in the Union were interviewed for the FBS in 1989. The second, the March Survey, was held only periodically. It collected information on socio-economic characteristics, incomes and durable ownership from a sample of about 310,000 households but did not cover expenditure or consumption.⁴

The operation of the FBS was shrouded in secrecy for many years but sufficient was known for it to be the subject of considerable criticism both inside and outside the USSR. The main reason for this was the sample design which left much to be desired. The survey was a quota sample of households of persons working in the state sector and on collective farms. This meant that a household's probability of selection increased with the number of working members, being zero in the case where no member worked. (This would appear to have excluded pensioner households, but it seems that some did in fact enter the sample.) The quotas favoured heavy industry and did not achieve full geographic coverage although a 50 percent increase in sample size in 1988 aimed to reduce these problems. The survey was a panel although this feature of the design does not appear to have been exploited. There was no organised rotation of households and respondents were pressurised to participate indefinitely.

These defects are substantial ones and undoubtedly imply that the FBS

³ We draw on more detailed descriptions given in Atkinson and Micklewright (1992, Chapter 3 and Sources and Methods).

⁴ Although the March Survey report provides numerous tables analysing household characteristics by the same ruble income classes as the FBS, the number of households or individuals in each income class is never given. In principle this information could be recovered by solving sets of linear equations implied by the data, for example from the information on the composition of each income class by household size which we use in Section 3. However, inversion of the relevant matrices did not yield sensible results (e.g. some household sizes were estimated to have negative weights). For this reason we focus on the FBS where the distribution of individuals across income classes is given.

is a far from satisfactory source for the study of living standards. The sample design suggests that households with low incomes may well be under-represented, which has serious implications for any analysis of poverty with the data.⁵ There is clearly much which should be done to improve the survey design so as to monitor living standards adequately in the transition period and beyond. However, as far as analysis of the pre-reform period in Central Asia is concerned, the researcher is faced with a choice of using the FBS and March Survey data in the form that they were collected or of doing nothing, and it is in this spirit which we use the data here. Even if the results cannot be seen as truly representative, the general picture presented by the data and the issues raised by their analysis are, we believe, of value. To date, much of the information in the FBS has been under-exploited due to the secrecy surrounding the survey results until the late 1980s.⁶

In 1989 the FBS collected information from a total of 3,005 households in Uzbekistan, of which two-thirds were households of "workers or employees" in state sector enterprises (we refer to these as worker/employees), and one-third were households of collective farm workers. This is a smaller sample than one would like but is substantially larger than the sample sizes for smaller republics in the Union: the planned sample size in 1988 was less than 2,000 households in nine republics (Atkinson and Micklewright, 1992, Table S6). The 1989 sample in Ukraine, the European republic we take for comparison, was substantially larger - nearly 17,000 households - again about one third of which were collective farm households.

We do not have access to the individual household level micro-data from the survey and this severely restricts the types of analysis we can make. The results we present are drawn from tabulations in the survey report which was published in two volumes, one for worker/employee households and one for collective farm households (Goskomstat, 1990). Each table in the two volumes is given first for the USSR and then for each republic. Table 1 gives the fullest information we have available on income distribution for Uzbekistan and Ukraine. The form in which much the data are published is also

⁵ The sample design of the March Survey was similar but was not a panel.

⁶ Other sources of information do exist on household living standards in the USSR, notably surveys of Jewish emigres from the USSR which have been used extensively e.g. Ofer and Vinokur (1992). However, besides being restricted to a particular socio-economic group these samples do not provide sufficiently large samples at the republic level. (The Ofer and Vinokur data relate to 1,250 urban households from the European republics only.)

illustrated by the table; information is often presented in terms of average values in eight per capita income classes. Income is gross of taxes and is given in the report in terms of the monthly equivalent of annual incomes, information on incomes being collected regularly throughout the year through repeated interviewing. In principle, income from all sources was included, including income from non-state sources, although the surveying effort made by Goskomstat may have varied with the income source (as may the veracity of respondents' replies).⁷ Notably, given our focus on an agricultural republic, income in kind from agriculture was included, valued at state prices.

In the bottom part of the table we show the income distribution data separately for worker/employee and collective farm households. The sample numbers given above imply that collective farm households were heavily over-sampled in both Uzbekistan and Ukraine. There appears to have been adjustment for this in the tables in the published report which are presented by Goskomstat grossed up to population level. The rural nature of the Uzbekistan population is reflected in the greater proportion of all individuals in collective farm households in the grossed-up figures, relative to Ukraine. Note that worker/employee households are far from being exclusively urban and the definition of this group includes households of employees on state farms as opposed to collective farms. The report of the 1989 March Survey records a third of worker/employee households in Uzbekistan living in rural areas (Goskomstat, 1990a, pp.20-22). (The rural/urban split is not given in the FBS report.)

In the case of Uzbekistan there is a notable difference between the two types of household in the incidence of low income, defined as income beneath 75 rubles per capita. Some 57 percent of individuals living in collective farm households are in this category compared to 39 percent of individuals in worker/employee households. In the top part of the table we have combined the separate data for the two types of household and have interpolated within income classes to obtain summary measures of income inequality.⁸ These

⁷ Information on earnings given by respondents was substantiated from employer records.

⁸ The availability of the mean income levels within each income class increases the accuracy of the estimates of inequality indices. The use of the means, together with a split of the 0-75 ruble class into two classes, implies that the results are considerably more accurate than those given in Atkinson and Micklewright (1992, Table UI3), where neither of these pieces of information was used.

measures indicate substantially higher per capita income inequality in Uzbekistan than in Ukraine.⁹

The 75 ruble per capita low income threshold on which we focus is close to the all-Union subsistence minimum income level calculated by Goskomstat for 1989 (Atkinson and Micklewright, 1992, Table UP2). Does it make any sense to use the same income poverty line across the whole Union, given variations in prices, climate, preferences and average living standards? This of course is a question relevant to any large political unit. The official poverty line in the USA is the same throughout the country. Measurement of poverty by the European Commission in the looser political confederation of the EC applies a different poverty line (in money terms) in each member state - 50 percent of average national income (more recently, expenditure). Table 1 shows that the 75 ruble threshold was almost exactly equal to 50 percent of average per capita income in 1989 in Ukraine, while in Uzbekistan 50 percent of the national average was less than 50 rubles. Moving to the measure used by the European Commission would imply income poverty to be about three times higher in Uzbekistan than in Ukraine rather than the seven times indicated by the application of the 75 ruble level in both republics. As this illustrates, the choice of income threshold would be of considerable importance in any study having the primary aim of making conclusions about differences in poverty across the former USSR. However, our interest in comparing Uzbekistan with Ukraine is largely methodological and for this purpose the 75 ruble line serves the purpose.

3. Household Size and Composition

The 75 ruble low income threshold is a *per capita* income line which makes no allowance for economies of scale with household size.¹⁰ This implies that large household sizes can be expected to be found near the bottom of the income distribution, other things being equal. This is brought out by Table 1 which gives average household size in each income class. The table also shows that there are much larger average household sizes in Uzbekistan - 4.9

⁹ Gini coefficients for comparably defined distributions for the late 1980s are estimated by Atkinson and Micklewright (1992, Table 5.5) as 0.20 in Czechoslovakia (1988), 0.24 in Hungary (1987), and 0.27 in Poland (1989).

¹⁰ The same is true of the slightly higher Goskomstat subsistence minimum income level for the late 1980s.

overall compared to 3.0 in Ukraine - a result of the high rate of population growth and consequent age structure of the population noted in the Introduction. In Figure 2 we show the distribution of household sizes in Uzbekistan and Ukraine, distinguishing between worker/employee households and collective farm households (the information in this instance is taken from the March Survey). The differences are striking, particularly for the collective farm households where the modal size in Ukraine is 2 persons but is 7 in Uzbekistan.

The use of a per capita threshold means that holding income constant we will find more people beneath the threshold in Uzbekistan with its large household sizes than in Ukraine where household sizes are smaller. Is this the explanation for the apparently much higher incidence of poverty in Uzbekistan than in Ukraine? In a similar comparison of Uzbekistan with the Russian Federation, the IMF and other international organisations opined that differences in household size and composition between the republics were indeed the main factor (IMF et al, 1991, vol II p.155).

Although access to the micro-data is necessary to fully explore this issue, the tables in the published report for the FBS do allow partial investigation. As far as household size is concerned, the report provides information on the distribution of income for different household sizes. If we hold household size constant, does the incidence of low incomes in Uzbekistan and Ukraine become quite similar? Unfortunately, the tables combine all households of size 6 or more into one group, which Figure 2 indicates is about two-fifths of all worker/employee households in Uzbekistan and two-thirds of collective farm households. So we can hold household size constant only for the smaller households. (No information on incidence of low income by household size is given in the March Survey report.) Figure 3 shows that for these households at least, the answer to the question just posed is in general negative. The incidence of low incomes, defined as per capita income less than 75 rubles per month, rises with household size in both republics, as one would expect given the per capita adjustment. But it rises much faster in Uzbekistan where the incidence is markedly higher than that in Ukraine for every household size greater than 2 in the case of the worker/employee households and for all sizes greater than 1 for the collective farm households.

The differences in the distributions of household size between the two republics do have some impact however on the relative incidence of low

incomes. This is shown by Table 2 where in the final line we estimate what would have been the incidence of low incomes in Uzbekistan had the distribution of household size in the republic been the same as that in Ukraine. In other words we apply the incidence rates by household size for Uzbekistan given in Figure 3 to the Ukraine distributions of household size given in Figure 2. The overall incidence of low incomes in Uzbekistan falls by about one-third but we are left with the conclusion that the bulk of the difference between Uzbekistan and Ukraine in incidence of low incomes defined on a per capita basis cannot be explained by the larger household sizes in the Central Asian republic.¹¹

The other part of the IMF et al thesis was that differences in household composition are important. One aspect of composition is the number of wage earners in the household. This could be expected to be important in Uzbekistan due to the impact of population growth on working opportunities. Population growth produced not just large household sizes in Uzbekistan but it was not matched pre-reform by growth in jobs. Central Asia came to be viewed within the USSR as an area of "labour surplus" (eg. Marnie, 1992). The growth in the rural working age population in Uzbekistan between 1979 and 1989 was particularly notable, rising by 38 percent (Demograficheskii ezhegodnik SSSR, Goskomstat, 1990, pp33-35, 39-41). As a result there were not only greater numbers of children to support in Uzbekistan, but a significant section of the working age population was classified as "dependent", i.e. without income from state employment, collective farms, or private plots, and not in receipt of a state pension or grant. This applied to 12.1 percent of the working age population in 1989, compared to 5.6 percent in the Ukraine (Statisticheskii press-bulleten', no.13, 1990, pp78-79). Lack of employment opportunities may be one reason for the relatively low participation rate of women of working age in Uzbekistan in state sector and collective farm employment of about 60 percent in 1989, compared to about 80 percent in Ukraine, although cultural factors and family responsibilities may be other factors (Marnie, 1992, p.171).

Given this evidence one would expect to see lower average number of

¹¹ In these estimates we are applying to all Ukraine households sizes of 6 or more the average Uzbekistan incidence rates for households of size 6+, a calculation which may be particularly affected by the rates for the larger household sizes within the 6+ group. However, the discrepancy introduced as a result in the overall incidence rates in line 3 of Table 2 is small since only relatively few individuals in Ukraine live in households of size 6+.

workers per household recorded in the 1989 survey data for Uzbekistan than for Ukraine, holding household size constant. ("Workers" here include both worker/employees and collective farm workers.) Figure 4 confirms this to be the case but the differences are not very great and appear insufficient to explain the markedly higher incidence in Figure 3 of low per capita incomes in Uzbekistan holding constant household size. (The source in this case is the March Survey since the FBS report does not contain the necessary information.) It should be remembered that large household sizes, where the differences in the average number of workers are large for worker/employee households, are rare in Ukraine. (When we do not control for differences in household size the average number of workers per household is in fact higher in Uzbekistan, especially for collective farm households, due to the differences in the distributions of household size illustrated in Figure 2.)¹²

The treatment of household size and composition is of obvious importance for future measurement of poverty in Uzbekistan, particularly in view of the shape of the distribution of household size. Low fixed costs of housing pre-reform may have reduced economies of scale in large households but many would argue that the lack of any allowance for scale economies is going too far. If scale economies do exist, the per capita adjustment will not only exaggerate the number of persons considered poor but it will also result in the composition of the poor being biased towards larger household sizes.¹³ This will have implications for the design of a 'safety net' aimed at protecting the living standards of those with low incomes during economic reform (Atkinson, 1992). For example, family benefits for households with large numbers of children could get a disproportionate amount of attention from policy makers in Uzbekistan.

¹² Among other explanations for differences in the incidence of lower incomes between Uzbekistan and Ukraine are wage levels. The 1989 March Survey data show 20 percent of individuals working in the state sector in Uzbekistan earning less than 90 rubles a month compared to 8 percent in Ukraine (Atkinson and Micklewright, 1992, Table UE6). Since our interest in comparing Uzbekistan and Ukraine is largely methodological we do not consider such factors further.

¹³ The March Survey report shows that households with 6 or more members made up half of urban worker/employee households in Uzbekistan beneath the 75 ruble per capita line in 1989, 2 in 3 of rural worker/employee households in the same position and 7 in 10 of collective farm households (Goskomstat, 1990a, pp.141, 142, 446).

4. Income in Kind from Agricultural Plots

The importance of the private agricultural plot to household living standards and to total agricultural output is something that repeatedly concerned scholars of Soviet life. Cultivation of the private plot was a form of private enterprise that was tolerated by the state. Individuals were free to sell produce on markets relatively free from controls or to keep and consume it within the household. This activity is of particular interest in Uzbekistan with its predominately rural population and large agricultural sector. Rumer (1989, pp125-6) reported private plots to have accounted for 46 percent of meat production in the republic in 1982 and 40 percent of milk and vegetable production. Lubin (1984, pp185-6) reports even higher figures which also suggest private agriculture to have been substantially more important in Uzbekistan than in other parts of the USSR. At the same time, concrete data on the importance of private agriculture to individual households has been hard to come by; Matthews (1986), in his account of poverty in the USSR, referred to the "mystery of the private plot" (p.42).

In this section we consider what the FBS and March Survey data suggests about the importance of private plots to household incomes in Uzbekistan. The March Survey shows the proportion of collective farm households and of rural worker/employee households with plots to be very high, 97 percent and 83 percent respectively (unfortunately no figure is given for urban worker/employee households). Almost identical proportions are found in the Ukraine data but plots are substantially smaller in Uzbekistan. Median plot size is in the interval 0.11-0.15 hectares for collective farm households in Uzbekistan compared to 0.36-0.40 in Ukraine. Medians for rural worker/employee households are in the intervals 0.07-0.10 hectares and 0.21-0.25 hectares respectively (Goskomstat, 1990a, pp.389, 511). The smaller sizes in Uzbekistan may reflect more use of more highly productive irrigated land. On the other hand, Rumer (1989) argues that population pressure in Uzbekistan has squeezed the availability of land for private plots.

As we noted in Section 2, income in kind from plots was included in the annual income concept which is behind the monthly income figures presented in the published FBS report. One reason for considering the data on plots in more detail is that Goskomstat valued plot production consumed within the household at official list prices in state retail outlets. There is widespread anecdotal evidence concerning shortages of food products in state

retail outlets in the Soviet economy pre-reform, including evidence from Uzbekistan (Lubin, 1984). This often resulted in much higher prices in other types of outlet, including legal collective farm markets in which collective farm households could sell produce from their private plots. By way of illustration, Table 3 gives information on prices of food in different outlets in Tashkent, the capital of Uzbekistan, and Kiev, the capital of Ukraine, in May 1989. The figures cannot be taken as representative of prices throughout the two republics, and in particular we would expect the collective farm market prices to be much higher in urban areas where produce was in less supply. Nevertheless the size of some of the differences is notable. The correct valuation of produce consumed within the household is the opportunity cost of consumption, which in this case could be viewed as the prices ruling in collective farm markets.¹⁴ This suggests that there may have been considerable undervaluation of this form of income in the FBS, although the problem will not have affected uniformly the data for all households with plot produce.

Figure 5 shows by income range the average share of total recorded income in the FBS accounted for by the cash value of all plot produce. (This includes both produce which is sold as well as that consumed within the household but the survey report shows that the latter is far more important.) The importance of plot income for collective farm households is striking and broadly similar in all income classes, around 20 percent in Uzbekistan and 25 percent in Ukraine. (The figures for collective farm households in Uzbekistan in the upper income ranges should be treated with caution; the sample size and the shape of the income distribution imply that they must be based on only a handful of households.) A rather different picture emerges for worker/employee households. Plot income is less important in the aggregate reflecting the lower incidence of ownership and the smaller plot sizes. However, whereas less than 5 percent of income is recorded as coming from plots for all income classes in Ukraine and for higher income classes in Uzbekistan, it is notable that about 15 percent of income is from this source for the low income group of 0-75 rubles in Uzbekistan, an income class that contains nearly two-fifths of the population in worker/employee households.

What impact would under-valuation of plot produce have on the income

¹⁴ The valuation is in practice more complicated since some goods were unobtainable even on collective farm markets. Lubin (1984, pp187-8) also points to the problem of valuing bartered produce.

data? Assume for sake of argument that all plot income was under-valued by Goskomstat by 50 percent. If this were the case, mean income of individuals in collective farm households in the 50-75 ruble range would rise from the figures of 62 and 65 rubles respectively for Uzbekistan and Ukraine given in Table 1 to 78 and 80 rubles. Considerable numbers of individuals in the 50-75 ruble range would no longer be classified as "low income". Undervaluation of plot income may have significantly exaggerated the picture of poverty in Uzbekistan among collective farm households (applying the conventional poverty line), and to a lesser extent among worker/employee households as well, especially those in rural areas with access to plots. (A further implication is that poverty among worker/employee households in Uzbekistan relative to that in Ukraine was overstated.) Poverty may be less concentrated on rural households than the data seem to suggest. This appears to confirm the first-hand anecdotal evidence on living standards of writers such as Lubin (1984) who have noted the relatively advantageous position of many rural households in Uzbekistan.

These findings have implications for measurement of living standards in Uzbekistan and for the design of social policy. As regards the former, the importance of recorded income in kind from agriculture, even when undervalued, suggests that the survey effort made in the past to monitor this source should certainly continue (we have drawn on only a small fraction of the FBS tables relating to private plots). However, that effort should be concentrated more than in the past on obtaining a reasonable valuation of income in kind, something that requires better monitoring of actual consumer prices than occurred in the pre-reform period. The importance of plot production may increase sharply with economic reform in the short-run. Falling average living standards in Uzbekistan can be expected to lead to increased reliance on home-production of food, something found in several other former socialist countries in transition (Rose and Tikhomirov, 1993). In addition, government policy in Uzbekistan during 1989-91 is said to have led to substantial increases in the number and size of private plots (Mamatkazin, 1991). Social policy needs to recognise the difficulty of targeting support via a means-test when a substantial proportion of the population, including those outside formal agriculture as a primary occupation, have income in kind which is difficult to measure and seasonal by nature. Correct measurement of such income is necessary not only to allocate resources at the individual household level but also to get the broad picture of which sectors of the population

have the most need for support.

5. Food Shares

To this point we have considered whether adjustment of recorded income would alter the picture of the amount of poverty as defined on an income basis. In this section we consider a different indicator of living standards - the share of food expenditure in total income. This is a commonly used indicator in less developed countries and seems a useful measure to consider in the case of Uzbekistan, not least so as to record the pre-reform levels of household welfare that it indicates.

One reason for expecting some difference between food share and per capita income as indicators of living standards is the evidence from other countries that suggests a household's food share to be a decreasing function of household size, when controlling for per capita income (e.g. Deaton, 1981). If this is the case, a food share measure of living standards allows for some economies of scale unlike the per capita income measure we have discussed to date.

The top half of Figure 6 shows the distribution of food shares recorded in the FBS data for 1989, taking worker/employee and collective farm households together. (These are distributions of households, not of individuals.) The distributions for Uzbekistan and Ukraine are rather different; high food shares were very much more common in 1989 in Uzbekistan, which would seem to be clear confirmation of lower living standards in that republic. Nearly a quarter of households in Uzbekistan had a food share exceeding 50 percent compared with little more than 5 percent in Ukraine. The median food share lies in the range 40-45 percent in Uzbekistan but in the range 30-35 percent in Ukraine.

The bottom half of the figure shows the average food share in each per capita income class in the two republics, distinguishing between worker/employee and collective farm households. As one would expect, food appears to have an income elasticity less than unity - the average shares decline with per capita income class. For example, the mean share for worker/employee households in Uzbekistan declines from 45 percent for the income class 50-75 rubles to 35 percent in the class 150-175 rubles. Despite the big differences between Uzbekistan and Ukraine in the overall distribution of the food share shown in the top of the figure, the mean food shares by

income class are very similar. This suggests that the big differences in per capita income between the two republics is doing much of the work in explaining the differences in the food share distributions.

Does low income always imply high food share? Besides giving the mean shares, the FBS report also provides information on the distribution of food share within each income class shown in Figure 6, and we give this in Table 4 for the Uzbekistan households. As one would expect there is significant variation around the mean values. For example, nearly a fifth of worker/employee households in Uzbekistan with per capita income of 50-75 rubles have food shares of less than 35 percent - close to the mean value for the 150-175 ruble class - while another fifth have shares of 55 percent or more - in excess of the mean for the 0-50 ruble class.

To further illustrate the variation of food share within income class we define a food share of 50 percent or more as "high". The choice is of course arbitrary; it is in fact close in both republics to the mean share for households with income less than 75 rubles per capita, the commonly taken low income poverty line.¹⁵ Table 5 cross-classifies the Uzbekistan households by high food share and low income, where the latter is defined as before as less than 75 rubles per capita. 44 percent of low income worker/employee households and 52 percent of low income collective farm households have high food shares. (The figures for Ukraine, not shown in the table, are interestingly somewhat lower, only 32 percent overall of low income households have high food shares.) Among the households with high food shares, 42 percent of worker/employee households and 25 percent of collective farm households are not classified as having low income. The degree of overlap between low income and high food share is sensitive to the definitions of these categories. Nevertheless, the general message of Table 5 is that the alternative indicator of living standards offered by the food share may lead to a significant change in the composition of the group of households considered poor. This suggests caution before basing the design of the safety net during economic reform on a single indicator of living standards.

One feature of the food share data is that even when we control for income class, the collective farm households often have somewhat higher shares

¹⁵ This level may be compared to figures of 56 and 51 percent respectively for the share of food in the 'current' and 'prospective' minimum budgets calculated in the 1960s by Sarkisyan and Kutznetsova (1967) which received considerable attention. (See Matthews, 1986, Table 1.1, p.20, and Atkinson and Micklewright, 1992, chapter 7).

than the worker/employee households. For example, Table 4 shows that the proportion of collective farm households with high food shares (50 percent or more) is greater in the four income classes up to and including 100-125 rubles (classes that contain nearly 90 percent of all collective farm households). Given the larger sizes of these households compared to those of the worker/employees, this is the reverse of what one would expect from the assumption that conditional on per capita income, the food share is a declining function of household size. The lower food shares for the worker/employees may reflect worse access to food in conditions of shortage prevailing pre-reform. This suggests that the usual interpretation of high food shares implying lower welfare may need to be qualified for collective farm households.

Another problem with the food share as a welfare indicator is suggested by the discussion in Section 4 of the valuation of income in the form of agricultural production consumed within the household. Assuming this also enters the definition of food expenditure, any undervaluation will bias downwards the food shares of households with this form of income.¹⁶ Given that the collective farm households have more income from this source, it would seem that correct measurement of this type of income would push the food share values for the collective farm households even higher above those of the worker/employee households.

6. Conclusions

Was Uzbekistan indeed characterised by high poverty pre-reform, relative to European republics of the Union, as suggested by data on the distribution of per capita income? Evidence from the 1989 Family Budget Survey (FBS) which we have presented supports this view. The large household sizes in Uzbekistan does not seem to be a major factor. With the Ukraine distribution of household sizes, the overall number of low income individuals in Uzbekistan would have fallen but only by about a third. Food shares were considerably higher on average in Uzbekistan.

The substantive question of relative poverty rates in Uzbekistan and Ukraine has occupied us less than the methodological issues surrounding the use of the FBS data to measure living standards. In exploring these issues

¹⁶ Put another way, re-valuation would add the same amount to both numerator and denominator of the share leading to an increase in its value.

we focused principally on nominal income data so as to shed light on an existing picture of poverty in Uzbekistan which was based on this measure. We considered food shares as an alternative indicator but interpretation of both nominal incomes and food shares is difficult if prices are not uniform across households, and there is considerable evidence that this was far from the case. Similarly, changes over time in these measures are difficult to interpret without a reliable price index. One may attempt to avoid such pricing problems by considering information on consumption. The FBS contains detailed information on consumption of different food items and purports also to provide information on the nutritional value of food consumed, with tables in the survey report on per capita calorie and protein intake by income level. We have resisted the temptation to use these data since the definitions of different food items are unclear as are the methods for calculating nutritional content. With further information on the survey technique, these may well be worthwhile indicators to explore.¹⁷

Proposing further use of the survey data supposes that they are of sufficient value to merit analysis. Future analysis, as well as that undertaken in this paper, is open to question due to the unsatisfactory nature of the pre-reform FBS design. One of our aims has been to air some of the issues relevant to design of household surveys which can more appropriately monitor the reform process. A proper geographic basis for a sampling so as to include all household types irrespective of the number of working members is a high priority. In particular, the presence in the survey of the unemployed and the retired must be ensured. We have also drawn attention to the valuation of agricultural production consumed within the household. Price reform may eventually mean that the distinction between state and free-market prices no longer applies but the importance of this type of income source in a largely rural agricultural republic demands that there be careful surveying and valuation. Finally, we note that for all its faults, the pre-reform FBS was a panel survey (albeit with no planned rotation of households), and this aspect of its design seems never to have been exploited. Who gains and who loses from economic reform are important questions and panel data have much to offer when seeking the answers.

¹⁷ A still broader analysis might include other indicators of living standards computed with aggregate data, such as infant mortality. (McAuley (1992) considers such aggregate measures for Uzbekistan and other Central Asian republics and makes comparison with Iran and Turkey.)

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Table 1
Income Distribution Data from Family Budget Survey, 1989

ALL HOUSEHOLDS

UZBEKISTAN

roubles per month per capita	nos. (millions)	percent individuals	av. per cap. monthly income	av. household size
0-50	3.196	16.0	37.40	7.62
50-75	5.541	27.7	61.28	6.52
75-100	4.546	22.7	85.89	5.46
100-125	2.825	14.1	111.84	4.40
125-150	1.670	8.3	135.90	3.84
150-175	0.937	4.7	162.59	3.22
175-200	0.535	2.7	186.11	3.06
200-225	0.311	1.6		
225-250	0.178	0.9	257.40	2.10
250+	0.277	1.4		
total	20.017	100.0	92.01	

Gini coefficient = 0.287

Decile ratio = 3.68

UKRAINE

roubles per month per capita	nos. (millions)	percent individuals	av. per cap. monthly income	av. household size
0-50	0.258	0.5	45.73	4.15
50-75	2.833	5.5	65.25	4.03
75-100	7.315	14.2	89.06	3.82
100-125	9.787	19.0	113.59	3.53
125-150	9.363	18.2	137.30	3.35
150-175	7.415	14.4	161.60	3.02
175-200	5.190	10.1	186.49	2.82
200-250	5.777	11.2	257.89	2.12
250+	3.562	6.9		
total	51.500	100.0	151.84	

Gini coefficient = 0.225

Decile ratio = 2.73

Table 1 continued

UZBEKISTAN

WORKER/EMPLOYEES

roubles per month per capita	nos. (millions)	percent individuals	av. per cap. monthly income	av. household size
0-50	1.987	13.8	36.36	7.59
50-75	3.539	24.7	60.91	6.21
75-100	3.230	22.5	86.10	5.03
100-125	2.172	15.1	112.30	3.97
125-150	1.390	9.7	135.39	3.61
150-175	0.820	5.7	162.39	3.02
175-200	0.486	3.4	185.77	2.91
200-225	0.290	2.0		
225-250	0.169	1.2	258.12	1.98
250+	0.270	1.9		
total	14.352	100.0	98.20	

COLLECTIVE FARMS

roubles per month per capita	nos. (millions)	percent individuals	av. per cap. monthly income	av. household size
0-50	1.209	21.3	39.11	7.66
50-75	2.002	35.3	61.92	7.08
75-100	1.317	23.2	85.39	6.53
100-125	0.653	11.5	110.32	5.83
125-150	0.280	4.9	138.45	5.00
150-175	0.117	2.1	163.98	4.62
175-200	0.049	0.9	189.55	4.56
200-225	0.022	0.4		
225-250	0.009	0.2	243.69	4.45
250+	0.008	0.1		
total	5.665	100.0	76.30	

Table 1 continued

UKRAINE

WORKER/EMPLOYEES

roubles per month per capita	nos. (millions)	percent individuals	av. per cap. monthly income	av. household size
0-50	0.214	0.5	46.06	3.83
50-75	2.351	5.7	65.32	3.89
75-100	5.997	14.5	89.19	3.70
100-125	7.941	19.2	113.76	3.47
125-150	7.528	18.2	137.30	3.32
150-175	5.914	14.3	161.58	3.03
175-200	4.095	9.9	186.44	2.82
200-250	4.550	11.0	256.73	2.08
250+	2.771	6.7		
total	41.360	100.0	150.72	

COLLECTIVE FARMS

roubles per month per capita	nos. (millions)	percent individuals	av. per cap. monthly income	av. household size
0-50	0.044	0.4	44.14	5.72
50-75	0.483	4.8	64.94	4.74
75-100	1.318	13.0	88.45	4.38
100-125	1.845	18.2	112.85	3.80
125-150	1.835	18.1	137.30	3.47
150-175	1.501	14.8	161.71	2.99
175-200	1.095	10.8	186.71	2.81
200-250	1.227	12.1	262.07	2.25
250+	0.791	7.8		
total	10.140	100.0	156.43	

Sources and Notes to Table 1:

Sources: (1) FBS 1989 Report vol I pp.13, 37, 43, vol II pp.3, 23, 35, (2) Kommunist Uzbekistana no. 11, 1990, (3) Sotsial'noe razvitiie SSSR 1989, p.119

Notes:

1. Despite distinguishing separately the 0-50 and 50-75 rubles classes in many tables, the FBS report, source (1), combines the two in the tables giving the numbers of individuals in each class (vol I, p.13, and vol II, p.3). In the case of Uzbekistan, we have been able to find this information for both worker/employee and collective farm households in source (2) which also gives the numbers separately for 200-225 and 225-250 rubles. For Ukraine, we found information for the number of individuals in the 0-50 and 50-75 ruble ranges only for the two types of household combined (source (3)) and we have assumed that the same relative proportions apply for both household types.

2. Figures for mean per capita income in each range are not published and we have estimated them by dividing mean total income in each range by mean household size. Note that these means are not given separately for the 200-250 and 250+ ranges.

3. Inequality indices for the overall distributions were estimated using the INEQ package written by F Cowell, LSE. Grouping assumption was Pareto and the top interval was also assumed Pareto; preliminary estimates without using the class means were made to obtain an estimate of the means of the 200-225 and 225-250 ranges (200-250 in the case of Ukraine). The mean for the unbounded range 250+ was then estimated using these preliminary estimates and the mean calculated from the published figures as described above for the whole 200+ interval. These estimates were then treated as data (along with the other calculated means) when estimating the inequality indices (to obtain convergence the lower bound of the data had to be set to 5 rubles for Ukraine).

Table 2
Accounting for the Effect of Differences
in the Distribution of Household Size

Percent of individuals of each household type
with monthly per capita income beneath 75 rubles per month

	Worker/ employee	Collective Farm	All
UZBEKISTAN	38.5	56.6	43.6
UKRAINE	6.2	5.2	6.0
UZBEKISTAN with Ukraine distribution of household sizes	24.9	41.6	29.6

Source: The figures in first two lines are taken from Table 1. The figures in the last line are calculated using the "low income" (less than 75 rubles) incidence rates of Figure 3 for Uzbekistan and the distributions of household size for Ukraine in Figure 2 (together with information on the average household size of households with 9 or more members taken from the March Survey pp.77 and 414).

Table 3
Prices in State Trade and Collective Farm Markets, 22 May 1989

Kopecks per kilo

	TASHKENT		KIEV	
	State Trade	Collective Farm Market	State Trade	Collective Farm Market
Potatoes	18	50	18	113
Cabbage	70	125	36	86
Onions	45	160	30	87
Meat	190	500	190	-
Milk (per litre)	24	-	28	60
Eggs (per 10)	80	118	90	213

Source: Statistical Press Biulleten', 1990, no.15, pp.20-31

Table 4
Distribution of Food Shares by Income Class in Uzbekistan

WORKER/EMPLOYEE HOUSEHOLDS										
income (rubles per capita)	Food Share greater than or equal to (%)									
	25	30	35	40	45	50	55	60	65	70
0-50	99.0	99.0	95.9	90.5	80.1	66.5	36.2	26.1	14.6	8.0
50-75	99.7	98.3	81.8	68.1	50.0	33.6	18.0	9.8	6.1	2.3
75-100	99.0	91.8	78.7	60.5	38.0	20.3	12.2	6.3	2.8	1.1
100-125	91.8	84.0	70.2	49.6	27.9	13.0	4.6	1.4	1.4	1.0
125-150	92.5	75.0	54.3	30.1	17.4	5.4	3.5	2.0	1.7	0.6
150-175	90.0	65.0	48.3	31.3	18.5	6.3	5.2	3.3	2.1	0.0
175-200	77.8	53.5	32.8	12.0	4.5	4.5	3.8	0.7	0.7	0.0
200+	83.8	57.8	35.0	21.6	9.1	4.7	2.4	0.9	0.9	0.0
All	93.5	82.0	66.3	49.3	32.7	19.6	10.7	6.0	3.6	1.5
0-75	99.5	98.5	86.2	75.2	59.5	44.0	23.7	14.9	8.8	4.1
75+	91.4	76.3	59.4	40.3	23.3	11.1	6.1	2.9	1.8	0.6
COLLECTIVE FARM HOUSEHOLDS										
income (rubles per capita)	Food Share greater than or equal to (%)									
	25	30	35	40	45	50	55	60	65	70
0-50	95.1	94.7	92.9	90.7	83.1	68.8	55.8	48.2	36.5	25.3
50-75	98.9	97.0	89.8	72.9	56.7	41.8	25.8	17.6	9.6	5.9
75-100	99.0	92.1	83.7	65.0	43.9	24.2	15.8	9.4	5.5	2.5
100-125	94.7	85.1	65.8	45.8	30.9	14.2	6.3	4.5	3.6	1.8
125-150	94.7	76.3	50.0	26.3	10.5	5.2	5.2	2.6	2.6	0.0
150-175	100.0	80.0	64.0	60.0	36.0	20.0	8.0	0.0	0.0	0.0
175-200	83.3	75.0	50.0	33.3	25.0	25.0	0.0	0.0	0.0	0.0
200+	66.6	33.3	22.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	96.9	91.1	81.2	66.1	50.6	35.3	24.0	17.7	11.9	7.4
0-75	97.5	96.2	90.9	79.3	66.2	51.5	36.5	28.6	19.2	12.9
75+	96.2	85.7	70.9	52.1	34.0	18.2	10.6	6.1	4.0	1.7

Source: FBS 1989 Report vol I pp.96-97 and vol II pp. 90-91.

Note: the distributions in this table are of households, not of individuals.

Table 5
High Food Shares versus Low Income, Uzbekistan

"High Food Share": 50% or more of household income spent on food
 "Low Income": monthly household income less than 75 rubles per capita

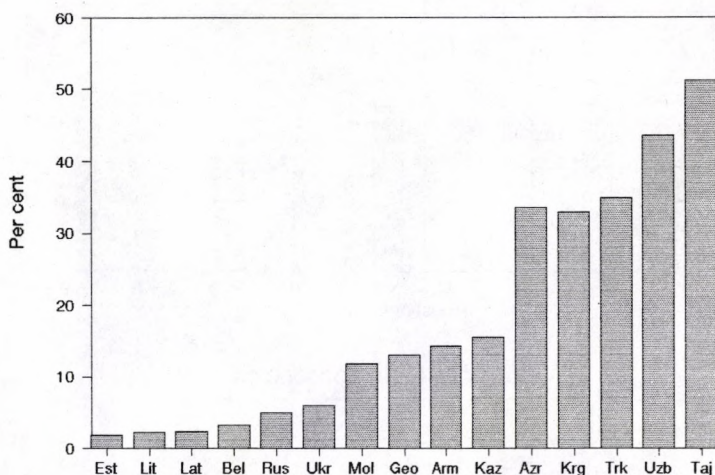
thousands of households
 row %
 column %

Worker/Employee Households			
		High Food Share	
		no	yes
Low Income	no	2,116 88.9% 82.0%	264 11.1% 41.9%
	yes	466 56.0% 18.0%	366 44.0% 58.1%
	all	2,582 80.4% 100.0%	630 19.6% 100.0%
Collective Farm Households			
		High Food Share	
		no	yes
Low Income	no	339 81.8% 61.3%	75 18.2% 24.8%
	yes	214 48.5% 38.7%	227 51.5% 75.2%
	all	553 64.7% 100.0%	302 35.3% 100.0%

Source: Tables 1 and 4

Note: the distributions in this table are of households, not of individuals. The distribution of income by households is derived from Table 1 by dividing the number of individuals in each income class by the class average household size.

Figure 1
Proportion of Individuals with Monthly Income
Less than 75 rubles per capita, USSR Republics 1989



Note:

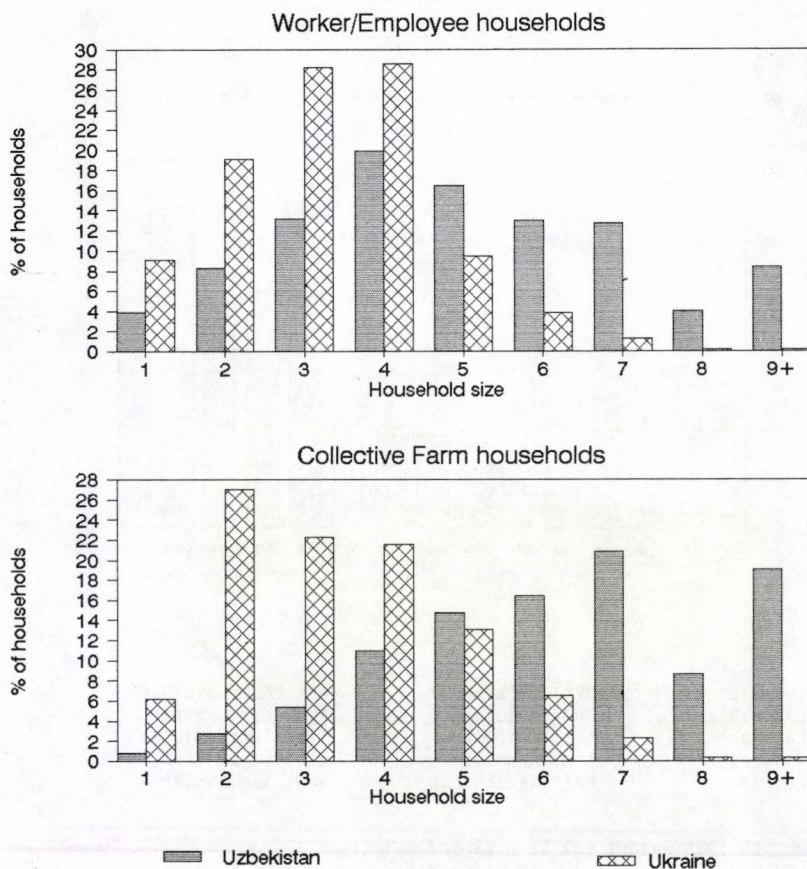
Est: Estonia
 Lit: Lithuania
 Lat: Latvia
 Bel: Belarus
 Rus: Russia

Ukr: Ukraine
 Mol: Moldavia
 Geo: Georgia
 Arm: Armenia
 Kaz: Kazakhstan

Azr: Azerbaidzhan
 Krg: Kyrghyzstan
 Trk: Turkmenistan
 Uzb: Uzbekistan
 Taj: Tajikistan

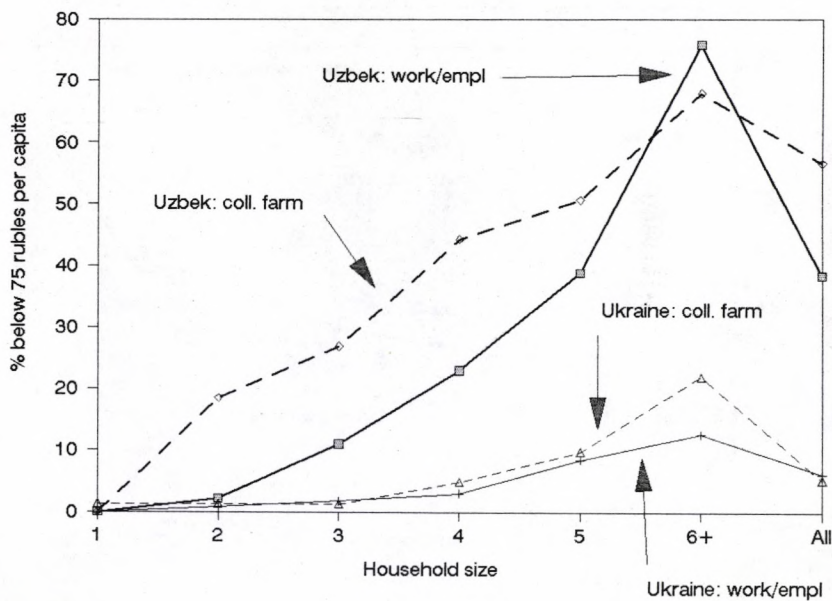
Source: FBS 1989 Report vol I, p.13 and vol II, p.3.

Figure 2
Distribution of Household Size



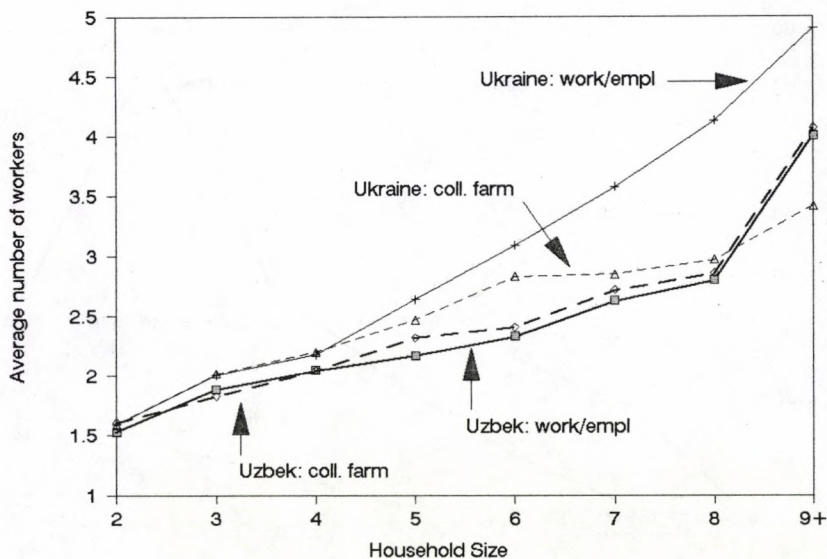
Source: March Survey 1989 Report pp. 138, 141 and 445-446.

Figure 3
Incidence of Low Incomes by Household Size



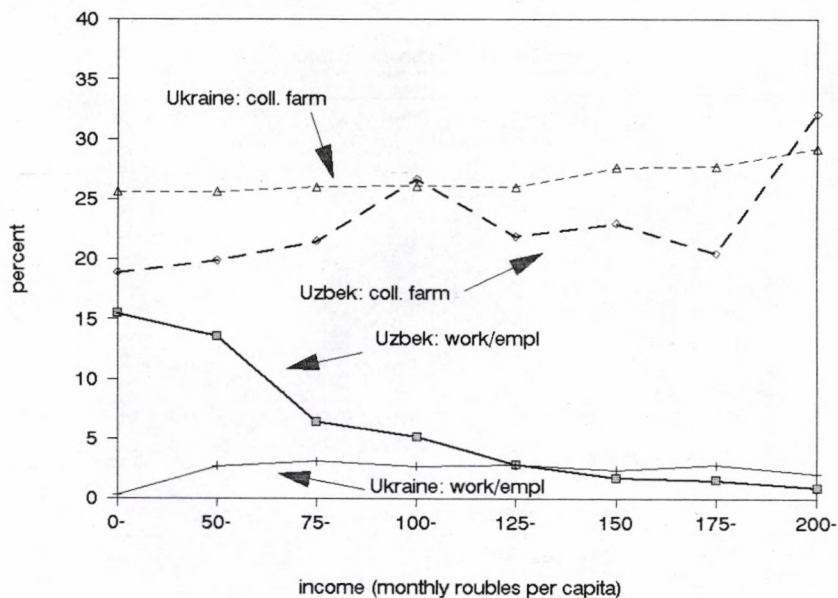
Source: FBS 1989 Report, vol I, p.21, vol II, p.11

Figure 4
Average Number of Workers by Household Size



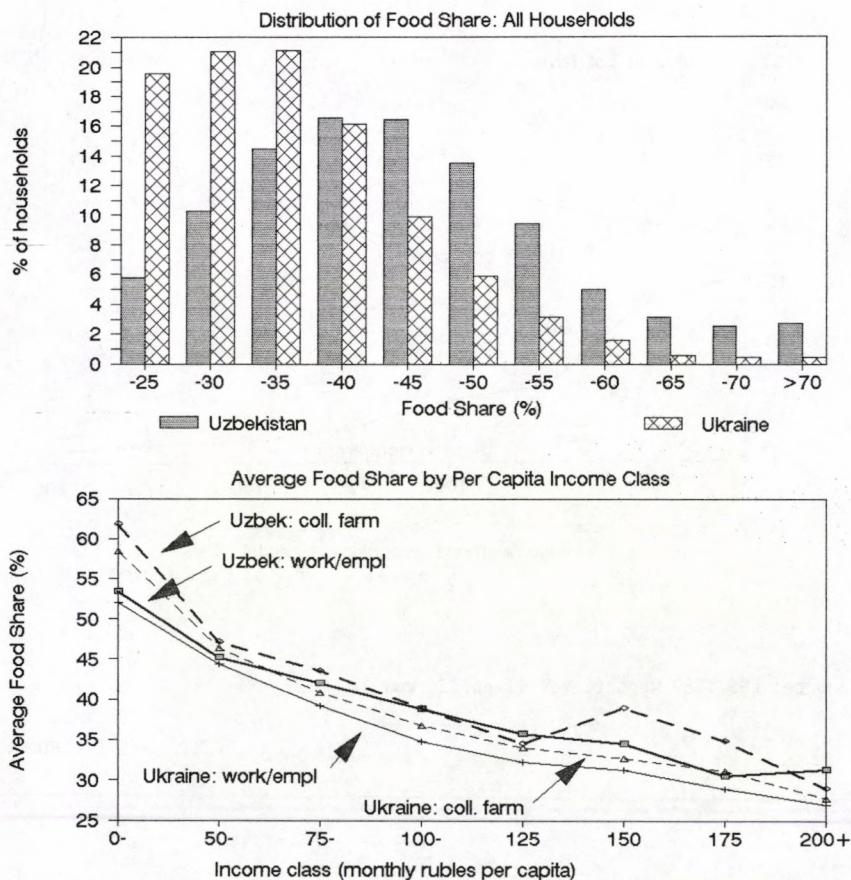
Source: March Survey 1989 Report pp.77, 83, 414, 416.

Figure 5
Proportion of Income from Private Agricultural Plots



Source: FBS 1989 Report, vol I, pp.43, vol II, p.35.

Figure 6
Distribution of Food Shares
and Average Food Shares by Income Class



Source: Tables 1 and 4, and FBS 1989 Report vol I pp.60-61, vol II p.53.



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